

MG702002 Mechanical Design 2

ELECTRIC VEHICLE SIDE ACCESS

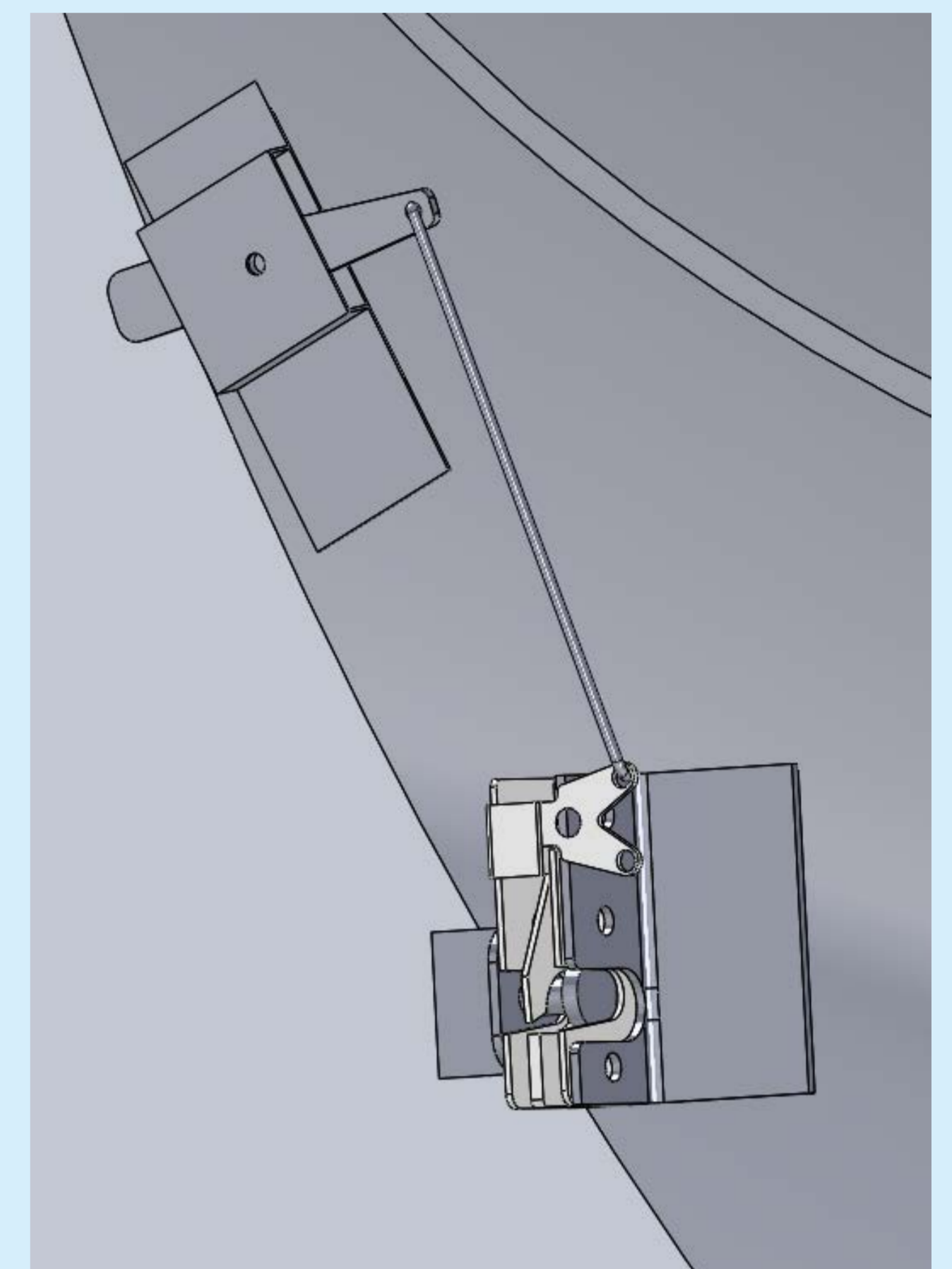
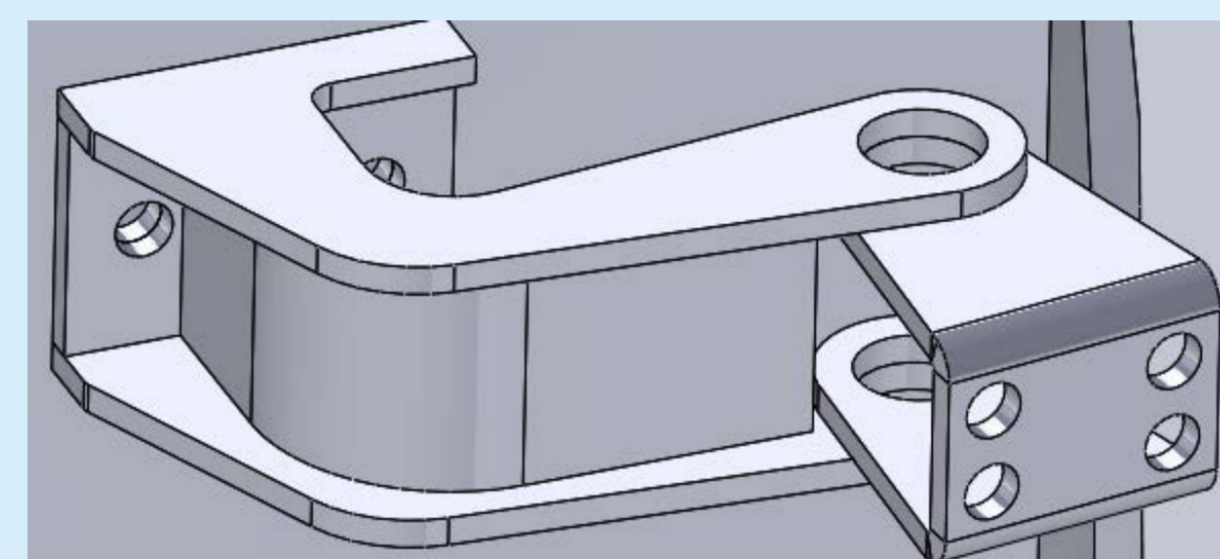
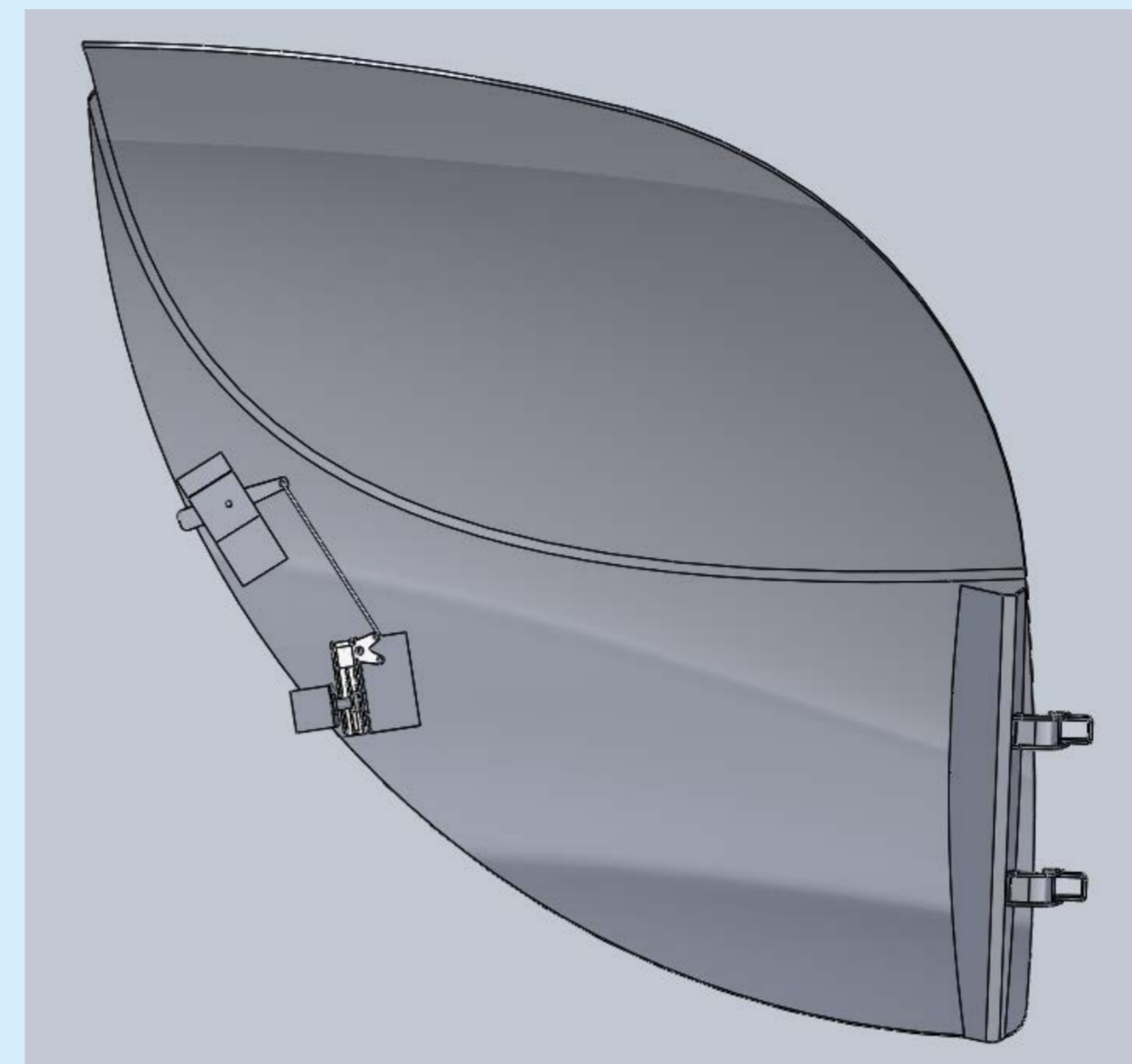
George Early, Yang Ma

PROBLEM STATEMENT AND CUSTOMER NEEDS

This aim of this project is to design and build a new type of electric vehicle. The design task of our group is to form a way to access the vehicle which is easy for the user, fits with the ergonomics of the existing shell, and is cost effective. This will involve considering how our space will integrate with other teams working around us.

DESIGN

- **DOOR WINDOW:** The door window is a ** Plastic that has a small section off aluminum trim around the top edge to give it strength when not resting on the body
- **HINGES:** The door hinges were fabricated in house out of aluminum. These were then attached to fiberglass door pillars on both the body and door that are re enforced
- **LATCH AND HANDLE:** The latch and pin was outsourced from Co-Mac while the handle was fabricated in house. They are connected via a short rod.
- **STRUCTURAL:** The door required support which was achieved by several sections of fiberglass that were molded then shaped to fit into areas such as door pillars and latch braces.



PROBLEM AREAS

Lack of stiffness through the hinges and surrounding structure is one weak point. It causes the door to interfere with the body of the car when opening and closing due to incorrect positioning, and also cause the door to struggle to sit flush when shut. The latch not catching the pin fully when shutting is another small weak point as it requires slightly more force to shut the door completely.

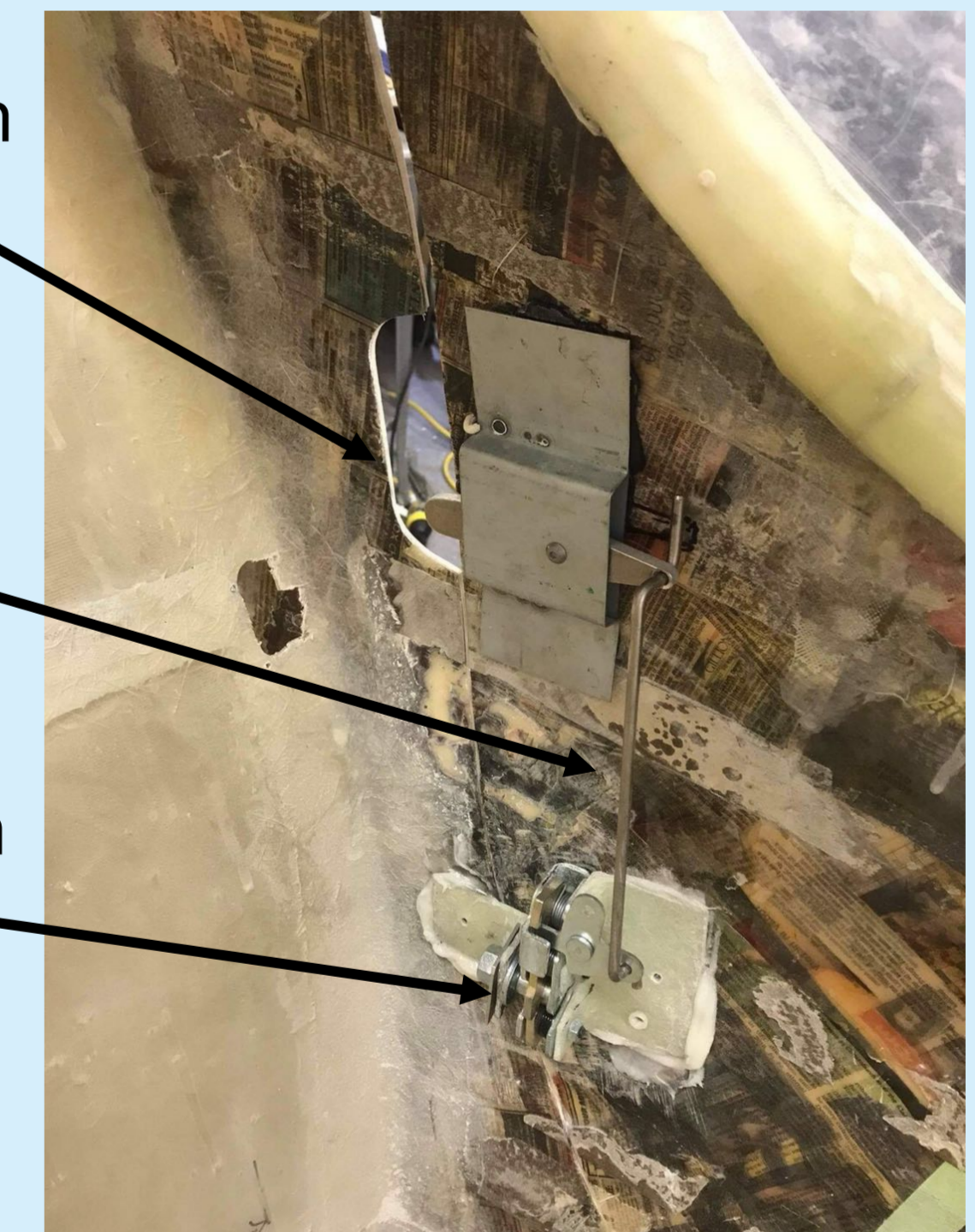
Aluminum angle around top edge of door window



Flexing comes from hinges and the surrounding door pillars shown



Handle system
Connection rod
Latch system



CONCLUSION AND RECOMMENDATIONS

Overall the project was a success in terms of providing access to the vehicle and meeting our scope.

Moving forward I would suggest first addressing these weak points.

The door/user interface can also be further developed and would likely include a handle of some kind, integrating the door latch while hiding the mechanism of the latching system.

Sealing of the door could also be developed and implemented to ensure a dry cockpit.

Pinch points around the hinges could also be minimized further to heighten safety.

THANKS

Many thanks to William Early, Ken Wyber, Linda Street, and Adam Liberatore for their work on this project.